Seismic Studies

Contract #: 500-01-025 **Work Authorization #:** E2I-WA-001
Contractor: Electricity Innovation Institute
Project Amount: $20,000
Contractor Project Manager: Ben Damsky (650) 855-2385
Commission Contract Manager: David Chambers (916) 653-7067
Status: Expired term

Project Description:
The purpose of this project is to seismically qualify substation equipment in accordance with the new Institute of Electrical and Electronics Engineers (IEEE) Standard 693, IEEE Recommended Practice for Seismic Design of Substations.

This project is needed to reduce costs by combining resources to qualify the equipment, and to have equipment that is pre-qualified so that facility construction is not delayed due to qualification. It will also qualify equipment that has the most vulnerable configuration so that other equipment variations can be qualified by similarity methods. A consortium of utilities will provide guidance to the project. Testing will be performed at appropriate test facilities as directed by the consortium.

This project supports the PIER Program objectives of:

- Improving the reliability/quality of California's electricity by qualifying substation equipment to meet the IEEE Standard 693.
- Improving the safety of California's electricity by providing utilities access to equipment that has been qualified in accordance with the standard.

Proposed Outcomes:

1. Develop improved seismic procedures for conducting shake-table tests on selected equipment.
2. Verify compliance of selected substation equipment with IEEE Standard 693.
3. Understand deficiencies of the standard for the qualification of transformer bushings and propose improvements.

Actual Outcomes:

1. Ten utilities formed a consortium under the Electric Power Research Institute with the purpose of qualifying substation equipment to IEEE 693.
2. Selected test facility, prioritized order of tests, established equipment support structure specifications, defined vibration test requirements, and determined specifications for electrical equipment and tests.
3. Tested and qualified eight Capacitor Voltage Transformers from two manufacturers, including a 230-kV (kilovolts) porcelain unit, a 500-kV porcelain unit, three types of 230-kV composite units, and three types of 500-kV composite units.
4. A draft report was submitted for Capacitor Voltage Transformer - CVT TEIMF 500CS.
5. Established the groundwork for testing and qualifying disconnect switches. This includes developing a support structure for the 230-kV switches, identifying switch manufacturers willing to participate, and developing an RFP to go to manufacturers.

6. Two models of transformer bushings have been developed that indicate that a more detailed model is needed.

Project Status:
The term of this project has expired. The final report is under review.